

# 6

## Subwatershed Management Plans

Each of the eight subwatersheds within the Gordon Creek watershed contain unique natural resources, land use practices, and opportunities for conservation, stewardship, and restoration. The following sections are designed to provide JCC staff and watershed stakeholders with a synopsis of the subwatershed conditions, while the their attendant maps offer an at-a-glance summary of subwatershed zoning and designated protection areas (e.g., RPAs), stream condition and known stream impacts, existing developments (parcel boundaries on 2009 aerial imagery), and proposed retrofit locations. Subwatershed maps can be used as a tool to assess future development projects, negotiate proffers, or review re-zoning requests (CWP 2003).

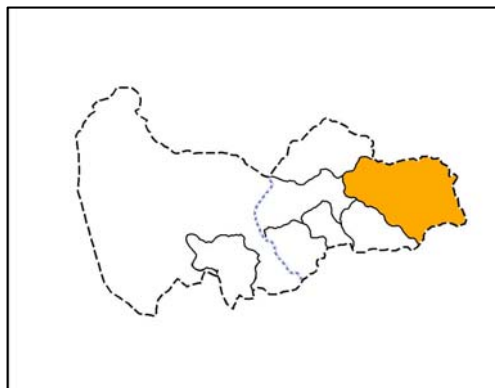
Subwatersheds descriptions and mapping are hereafter presented in numeric order, starting with the headwaters (101 through 106) and continuing on to the non-tidal mainstem (201) and the tidal mainstem (202). Each subwatershed description commences with information on subwatershed drainage areas and linear footage of mapped streams as well as relative acreages of RPA, NWI-mapped wetlands, forest, marshland, agricultural and forestal district, and zoning categories. For this first draft, developable area was roughly calculated as any area not zoned as Public Land, RPA, NWI wetlands, or marshland. The source for all data is the JCC GIS/Mapping Section, with estimates of forested land and impervious cover being derived from the CWP *Baseline Assessment* (CWP 2008).



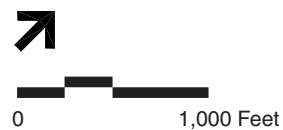
## 6.1 Subwatershed 101

Table 6-1. Subwatershed 101 Summary

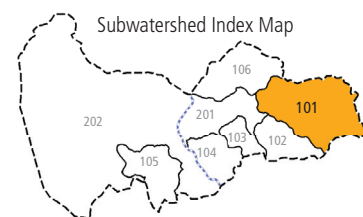
General Characteristics	Area (ac) / Length (ft)	% Area
Drainage Area	1202.13	100.0
Length of Mapped Streams	27376	--
Existing RPA	252.85	21.0
NWI Mapped Wetlands	61.96	5.2
Marshlands	4.97	0.4
Forested Land	1063.62	88.5
Developable Area	458.36	38.1
Agricultural and Forestal District	--	--
Zoning		
General Agriculture	504.18	41.9
General Business	0	0.0
General Residential	49.37	4.1
Limited Business	0	0.0
Low-Density Residential	0	0.0
Public Lands	648.58	54.0
Residential Planned Community	0	0.0
Land Use and Stream Condition	Current	Future
Impervious Cover	1.56	8.7
Subwatershed Classification	sensitive	sensitive







data provided by CWP, January, 2008



# GORDON CREEK Watershed Management Plan

Figure 6-1

**Watershed Conditions  
Subwatershed 101**



## Existing Land Use

Subwatershed 101 is the northernmost drainage in the Gordon Creek watershed (Figure 6-1). It drains an area approximately 1,209 acres in size. Under current land use, Subwatershed 101 contains roughly 88 percent forest cover with approximately 1.6 percent impervious surfaces. More than half of Subwatershed 101 is zoned as Public Lands and over 40 percent of the total area is zoned as a General Agricultural District (A-1). A-1 zoning is intended for application to the rural areas of JCC generally outside of the primary service area and where utilities and urban services generally do not exist and are not planned for in the near future. The purpose of the district is to maintain a rural environment suitable for farming, forestry, and low-density rural residence, while providing for certain recreational and public or semipublic and institutional uses requiring a spacious site compatible with rural surroundings.

A small portion of the watershed located to the east of Stream Reach 104 is zoned as a General Residential District (R2). As described in the County Code, this zoning district is composed of quiet, low-density residential areas as well as certain open areas where similar residential development is likely to occur. As a result, clustering of residential developments maximize shared and purposeful open space and prohibit activities of a commercial nature. Permitted uses are limited to dwellings designed to be occupied by one family or more than one family under certain conditions plus certain additional community-oriented uses that serve the residents of the district. Development is limited to a maximum gross density of one unit per acre.

## Development and Activity in Subwatershed 101

The J. Blaine Blayton Elementary and Lois Hornsby Middle Schools were recently completed in this subwatershed. While the watershed is largely undisturbed, an active open-pit aggregate mine and associated access roads fragment the contiguous forest in the northern portion of the drainage area and necessitate two stream crossings in the headwaters of Gordon Creek.

## General Stream Conditions

As described in the *Baseline Assessment and Conservation Area Plan*, assessed stream reaches within this subwatershed received habitat ratings between 'good' and 'excellent' (CWP, 2008). The relatively undeveloped setting of the watershed is reflected in the high quality of its streams; however, those receiving the 'good' rating were all first order headwaters. It is possible that these slightly impacted streams may have some influence from Jolly Pond Road and the cleared residential lot adjacent to Stream Reach 101 (RCH 101). However, the majority of surface waters are in excellent condition, and the influence from the limited development in Subwatershed 101 is minimal.

The following table summarizes specific stream impacts within Subwatershed 101 identified by the CWP during field reconnaissance. Refer to Figure 6-1 for the locations of these impacts.





**Table 6-2. Summary of Stream Impacts / Miscellaneous Features in Subwatershed 101**

Site ID	Subwatershed	Description
CM-401	101	Channelization by riprap
IB-100	101	Right bank of Reach 105 cleared for development
MI-100	101	Location of aggregate quarry
MI-101	101	Large area of cleared land for development
MI-401	101	Beaver dam at end of Freedom Park. Flooding.
OT-100	101	Single 30-inch metal outfall
SC-100	101	Single 12-inch metal culvert crossing at residential driveway
SC-101	101	Single 18-inch metal culvert crossing at construction road
TR-100	101	Historic dumping in floodplain

### **Stormwater Strategy**

#### Special Stormwater Criteria

New development and previously unreviewed development plans should implement on-site stormwater practices in accordance with the SSC to preserve high quality habitat.

#### Additional Comments

- Leave riprap-lined channel at Freedom Park (CM-401) unchanged, unless observed instability;
- Implement a long term monitoring strategy for observe how changes in the watershed are affecting stream stability, sedimentation, and water quality. Use volunteers with proper training under the existing monitoring program if possible;
- Beaver dam modification. See Section 1.2.1 for potential retrofitting at this location;
- Assess condition of all outfalls and stream crossings. Unless there is a stability problem, no action is required;
- Organize volunteers for floodplain cleanup;
- Utilize Better Site Design (BSD) principals in new construction to maintain existing hydrology, preserve contiguous open space, and minimize impacts from impervious surfaces.

### **Conservation Opportunities**

A beaver-modified dam in the lower reaches of Subwatershed 101 has resulted in a high quality wetland system downstream and a large open water pond upstream, comprising the central portion of the drainage. This area is known as Colby Swamp. As the impounded mainstem of

Gordon Creek, Colby Swamp is the receiving body for all tributaries in the subwatershed. Conservation opportunities at this location are high, ranked fourth in the *Baseline Assessment and Conservation Area Plan*. The high habitat and water quality value of this area is represented by the presence of a mature contiguous forest and high level of wetland diversity. This site also includes the occurrence of a bald eagle nesting site, though current activity is unknown.

As the parcel containing these sensitive resources is slated for development, utilization of BSD principles is important both for the protection of critical wildlife habitat and for reducing stormwater impacts related to development. Where development is not yet proposed, recommendations include incentivizing the preservation of upland areas adjacent to wetlands and existing RPA boundaries. In so doing, development pressure in the subwatershed is reduced and the area of protection is expanded. Refer to Conservation Area ID C3 in Table 1-3 and in Figure 1-7.

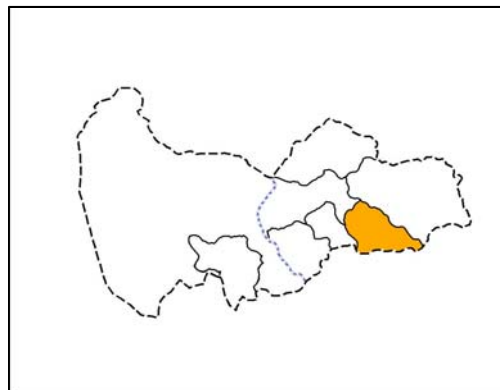




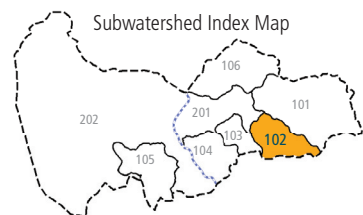
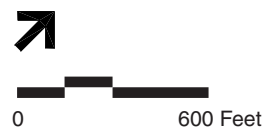
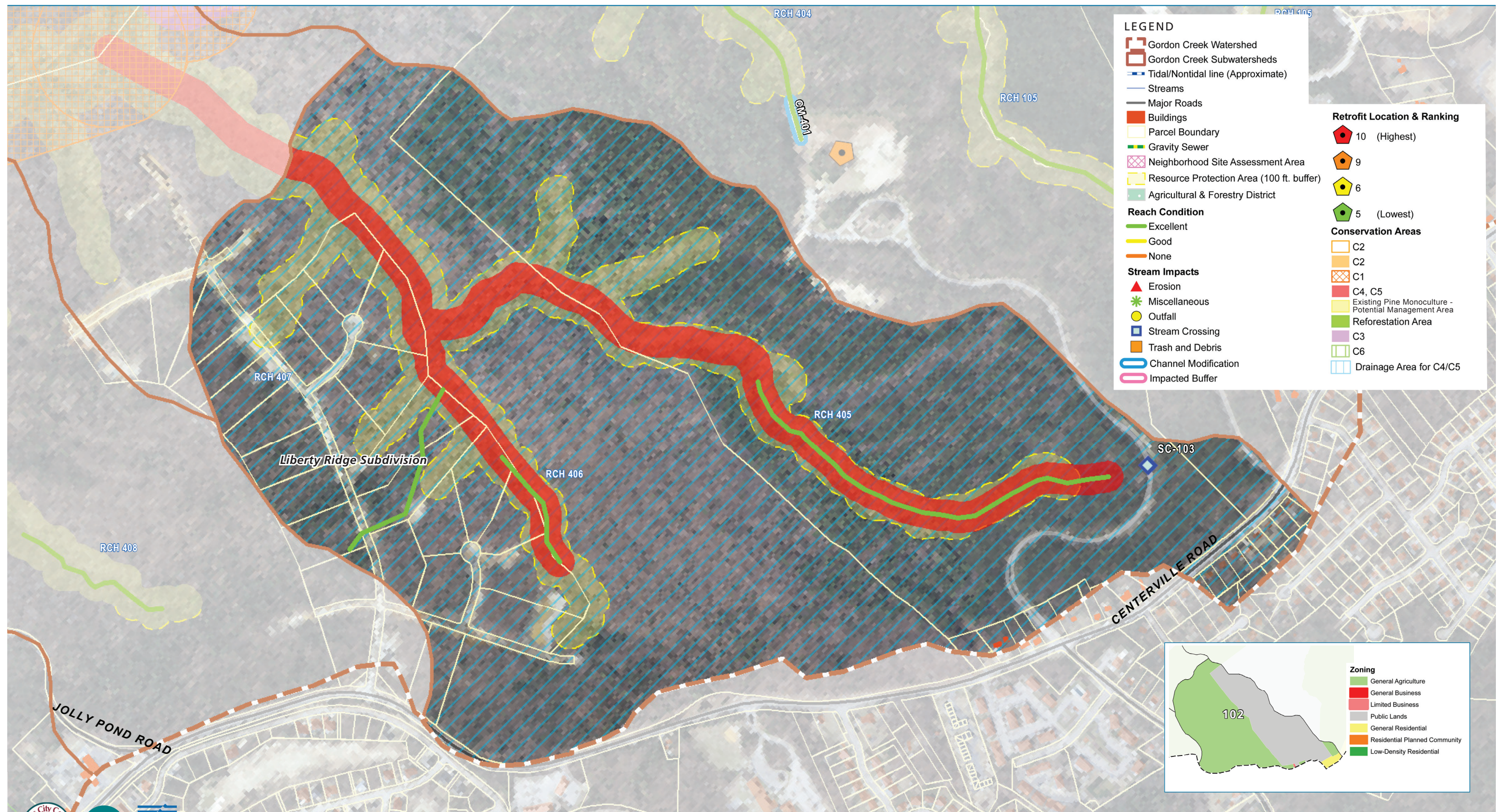
## 6.2 Subwatershed 102

Table 6-3. Subwatershed 102 Summary

General Characteristics	Area (ac) / Length (ft)	Percent of Subwatershed Area
Drainage Area	419.42	100.0
Length of Mapped Streams	8588	--
Existing RPA	80.2	19.1
NWI Mapped Wetlands	16.57	4.0
Marshlands	0	0.0
Forested Land	392.32	93.5
Developable Area	210.64	50.2
Agricultural and Forestal District	--	--
Zoning		
General Agriculture	244.98	58.4
General Business	0	0.0
General Residential	6.12	1.5
Limited Business	0.29	0.1
Low-Density Residential	0	0.0
Public Lands	167.99	40.1
Residential Planned Community	0	0.0
Land Use and Stream Condition	Current	Future
Impervious Cover	1.25	8.2
Subwatershed Classification	sensitive	sensitive







data provided by CWP, January, 2008

# GORDON CREEK Watershed Management Plan

Figure 6-2

**Watershed Conditions  
Subwatershed 102**



### Existing Land Use

Subwatershed 102 is located just southeast of Subwatershed 101 (Figure 6-2). It drains an area of approximately 429 acres and is approximately 92 percent forested with less than 1.5 percent impervious surfaces. Over half of the subwatershed is zoned as A1; however, approximately 40 percent of the total area remains under sole ownership of JCC as Public Lands.

### Development and Activity in Subwatershed 102

Drainage in Subwatershed 202 appears to be largely natural and the effects of development appear to be negligible.

### General Stream Conditions

As described in the *Baseline Assessment*, all of the assessed stream reaches within this subwatershed received ‘excellent’ habitat ratings. Based on recent aerial photography, there are few if any permanent structures within the subwatershed except for Liberty Ridge Road and portions of the access road to Freedom Park. The only indications of contiguous forest fragmentation within the drainage area are the locations of these two features. Stream Reach 405 (RCH 405) receives some drainage from the Freedom Park access road, but conditions at the road crossing are stable. Furthermore, the *Baseline Assessment* found RCH 405 to be of ‘excellent’ quality.

The following table summarizes specific stream impacts within Subwatershed 102 identified by the CWP during field reconnaissance. Refer to Figure 6-2 for the locations of this feature.

**Table 6-4. Summary of Stream Impacts / Miscellaneous Features in Subwatershed 102**

Site ID	Subwatershed	Description
SC-103	102	Double 48-inch circular concrete pipes on entrance road to Freedom Park

### Stormwater Strategy

#### Special Stormwater Criteria

New development and previously unreviewed development plans should implement on-site stormwater practices in accordance with the SSC to preserve high quality habitat.

#### Additional Comments

- Assess condition of all outfalls and stream crossings following guidance provided in the CWP’s *Unified Stream Resource Manual 10*. Unless there is a stability problem, no action is required.
- Utilize BSD principles in new construction to maintain existing hydrology, preserve contiguous open space, and minimize impacts from impervious surfaces.



## Conservation Opportunities

The undisturbed, natural channels, contiguous forested areas, and high quality wetlands throughout the Subwatershed 102 all contribute to excellent habitat conditions and conservation potential. Land preservation in this subwatershed is ranked second in the *Baseline Assessment and Conservation Area Plan* conservation prioritization, and protection of existing stream channels is ranked sixth.

The stream channels draining Subwatershed 201 are largely protected within Freedom Park, however, a downstream reach runs adjacent to the Liberty Ridge subdivision where future development is proposed. This channel is characterized by the fossilized shell marl formations forming its bed. The shells impart calcium to the soil, thereby creating circumneutral, highly fertile conditions favorable to vegetation more common in piedmont and mountainous soils. As a result, the vegetated community may be locally rare.

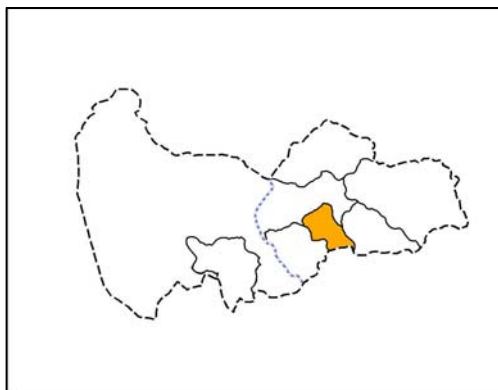
Recommendations include incentivizing the preservation of upland areas adjacent to wetlands and contiguous with the existing RPA in order to limit development and reduce fragmentation of habitat. Where development is permitted, s BSD principles should be encouraged in construction plans. Refer to Conservation Area IDs C4 and C5 in Table 1-3 and in Figure 1-7.



## 6.3 Subwatershed 103

**Table 6-5. Subwatershed 103 Summary**

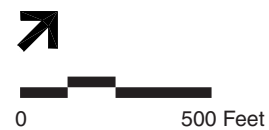
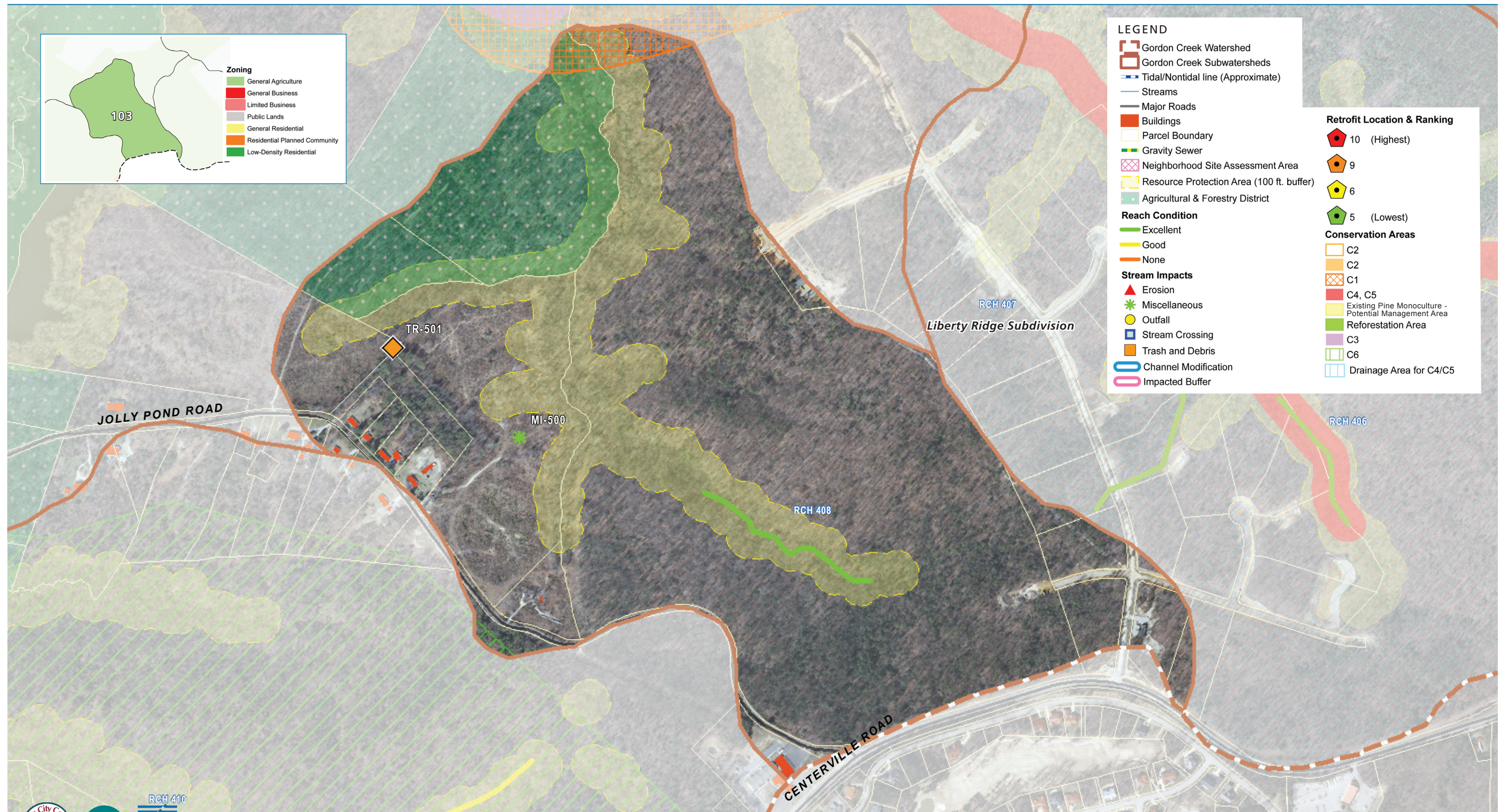
General Characteristics	Area (ac) / Length (ft)	Percent of Subwatershed Area
Drainage Area	222.98	100.0
Length of Mapped Streams	4253	--
Existing RPA	50.02	22.4
NWI Mapped Wetlands	11.46	5.1
Marshlands	0.49	0.2
Forested Land	208.23	93.4
Developable Area	177.31	79.5
Agricultural and Forestal District	26.74	12.0
Zoning		
General Agriculture	222.98	100.0
General Business	0	0.0
General Residential	0	0.0
Limited Business	0	0.0
Low-Density Residential	0	0.0
Public Lands	0	0.0
Residential Planned Community	0	0.0
Land Use and Stream Condition	Current	Future
Impervious Cover	3.07	12.2
Subwatershed Classification	sensitive	impacted



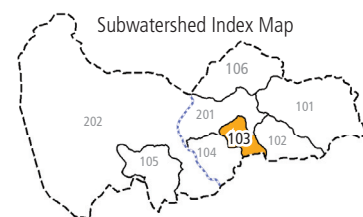


This Page Intentionally Left Blank





data provided by CWP, January, 2008



# GORDON CREEK

## Watershed Management Plan

Figure 6-3

**Watershed Conditions**  
**Subwatershed 103**



### Existing Land Use

Subwatershed 103 is located south of and adjacent to Subwatershed 102 (Figure 6-3). It is the smallest subbasin within the Gordon Creek watershed, draining an area of approximately 227 acres. It is approximately 92 percent forested with roughly 3 percent impervious surface. The subwatershed is zoned entirely as a General Agricultural District (A-1).

### Development and Activity in Subwatershed 103

The Liberty Ridge residential development is located in this subwatershed. The site is approximately 535 acres of undeveloped, forested land. Plans include construction of 139 homes on 3-acre lots.

### General Stream Conditions

As described in the *Baseline Assessment*, Stream Reach 408, the only reach in this subwatershed, received an ‘excellent’ habitat rating (CWP, 2008). There are two small residential developments in the southern and southeastern portions of the subwatershed, but the majority of the drainage area is undeveloped. The effects of the low-density residential development on surface waters of Subwatershed 103 appear to be negligible.

The following table summarizes specific stream impacts within Subwatershed 103 identified during field reconnaissance. Refer to Figure 6-3 for the locations of these impacts.

**Table 6-6. Summary of Stream Impacts / Miscellaneous Features in Subwatershed 103**

Site ID	Subwatershed	Description
MI-500	103	Cleared area near Jolly Pond Road. Contains slash from clearing activities
TR-501	103	Trash dump located behind residence on Jolly Pond Road

### Stormwater Strategy

#### Special Stormwater Criteria

New development and previously unreviewed development plans should implement on-site stormwater practices in accordance with the SSC to preserve high quality habitat.

#### Additional Comments

- Implement a long term monitoring strategy for observe how changes in the watershed are affecting stream stability, siltation, and water quality
- Approach landowner(s) about cleaning up trash and/or organize volunteer trash cleanup similar to Save the Bay Day.
- Utilize BSD principles in new development to maintain existing hydrology, preserve contiguous open space, and minimize impacts from impervious surfaces.

### Conservation Opportunities

Subwatershed 103 is largely undeveloped, draining to an area of Colby Swamp just upstream of Jolly Pond. Stream habitat quality within the subwatershed is excellent, as indicated in the *Baseline*



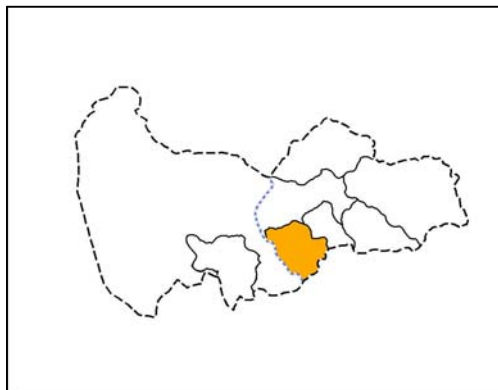
*Assessment.* The lower portion of this subwatershed also provides bald eagle habitat, with the occurrence of a known eagle nest in close proximity.

Recommendation include incentivizing the preservation of upland areas adjacent to wetlands and the existing RPA in order to limit development and reduce fragmentation of contiguous habitat, with special consideration for protecting potential eagle nesting sites and hunting areas in the lower portions of Subwatershed 103. Where development is permitted, BSD principles should be incorporated into construction plans.

## 6.4 Subwatershed 104

**Table 6-7. Subwatershed 104 Summary**

General Characteristics	Area (ac) / Length (ft)	Percent of Subwatershed Area
Drainage Area	394.63	100.0
Length of Mapped Streams	10387	--
Existing RPA	113.72	28.8
NWI Mapped Wetlands	29.78	7.5
Marshlands	0	0.0
Forested Land	360.93	91.5
Developable Area	284.22	72.0
Agricultural and Forestal District	7.11	1.8
Zoning		
General Agriculture	393.10	99.6
General Business	0	0.0
General Residential	0	0.0
Limited Business	0	0.0
Low-Density Residential	0	0.0
Public Lands	0	0.0
Residential Planned Community	1.53	0.4
Land Use and Stream Condition	Current	Future
Impervious Cover	1.5	11.0
Subwatershed Classification	sensitive	impacted

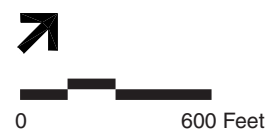
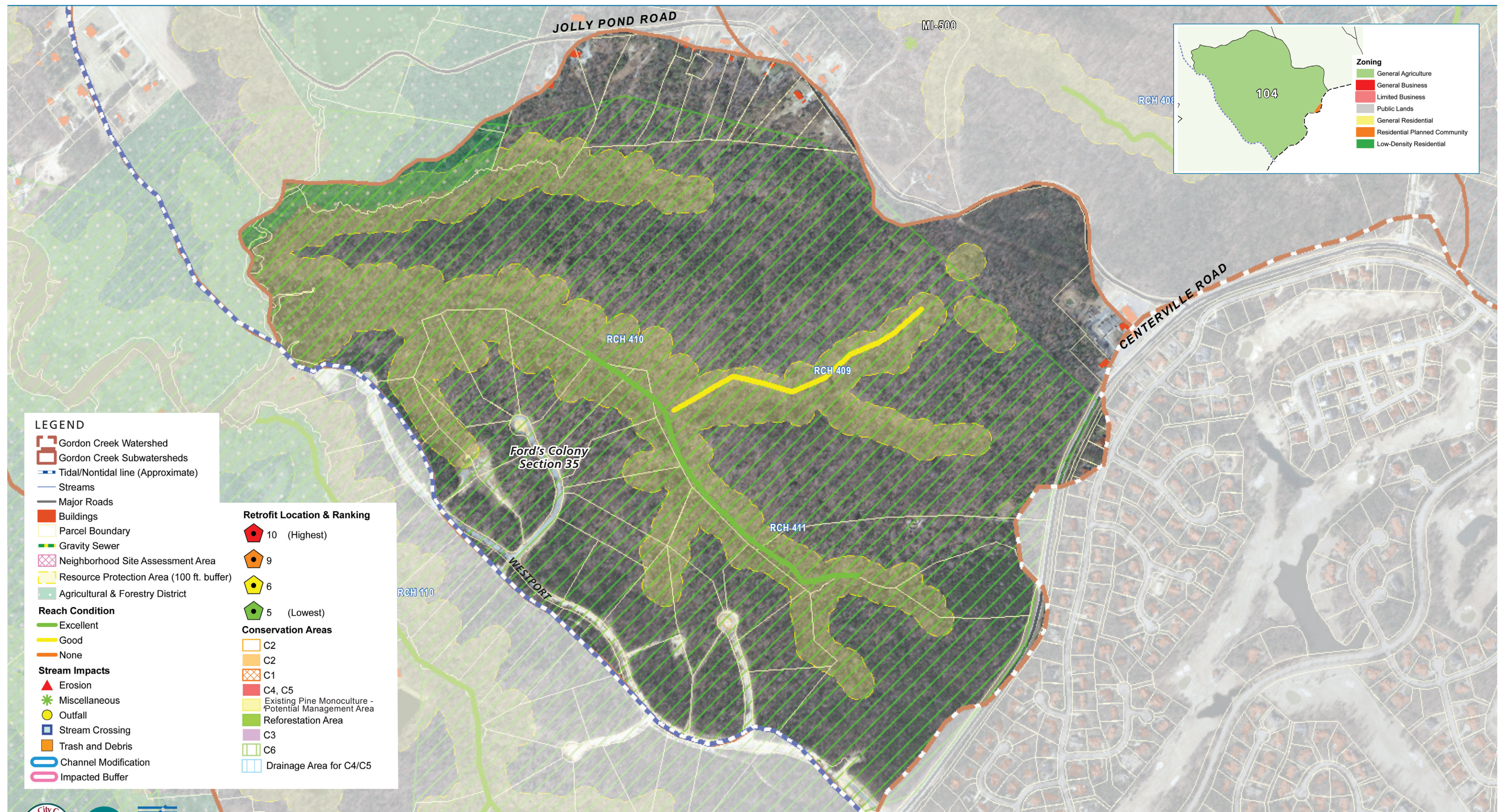




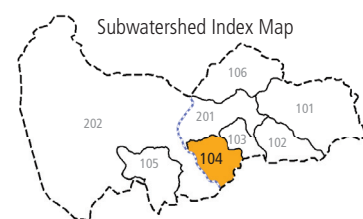


This Page Intentionally Left Blank





data provided by CWP, January, 2008



# GORDON CREEK

## Watershed Management Plan

Figure 6-4

**Watershed Conditions**  
**Subwatershed 104**



### Existing Land Use

Subwatershed 104 is located southeast of Subwatershed 103 (Figure 6-4). The southern border of the drainage area marks the upper limit of tidal influence. The drainage area is approximately 395 acres in size and is approximately 91 percent forested with approximately 1.5 percent impervious surface. Subwatershed 104 is almost entirely zoned as A1 and is largely undeveloped, forested open space with some residential development along the southern boundary and along Jolly Pond Road at its northwestern corner. Residential Planned Community lots exist in a small section along the northeastern portion of the subwatershed.

### Development and Activity in Subwatershed 104

At the subwatershed's northwestern corner, access roads for lots associated with a future development have been constructed, and platted lots constitute roughly a third of the subwatershed area. The unnamed development encompasses an approximately 417-acre undeveloped site with plans to develop 98 three-acre lots. The development plans for this site include low impact development (LID) practices, and HOA covenants require strict on-lot LID practices be implemented for new home construction.

### General Stream Conditions

According to the *Baseline Assessment*, two of the three assessed stream reaches within this subwatershed received 'excellent' habitat ratings and one reach received a 'good' rating (CWP, 2008). The cause of the slight degradation of Stream Reach 409 (RCH 409) is not obvious; however, it may be related to stormwater runoff from Jolly Pond Road which forms the northern boundary of the subwatershed. In general, surface waters in Subwatershed 104 are high quality natural channels and the effects of development appear to be minimal.

Table 6-8. Summary of stream impacts/miscellaneous features in Subwatershed 104

Site ID	Subwatershed	Description
OT-300	104	Single 36-inch circular concrete outfall. Chipped/cracked with moderate flow. Trash present.

### Stormwater Strategy

#### Special Stormwater Criteria

New development and previously unreviewed development plans should implement on-site stormwater practices in accordance with the SSC to preserve high quality habitat.

#### Additional Comments

- Re-assess all outfalls for stability and water quality following guidance provided in the CWP's *Unified Stream Resource Manual 10*. If stability problems, sedimentation, or pollutant loading, stormwater retrofits may be necessary. If outfalls are chipped but stable and functional, no action is necessary at this time.
- Organize volunteers to pick up trash similar to Save the Bay Day.



- Utilize BSD principles in new construction to maintain existing hydrology, preserve contiguous open space, and minimize impacts from impervious surfaces.

### Conservation Opportunities

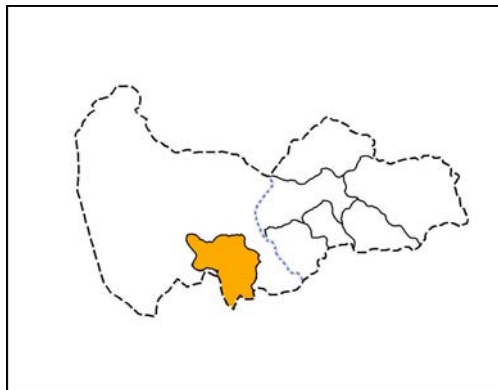
The *Baseline Assessment and Conservation Area Plan* ranks the lower half of the Gordon Creek watershed, including the main area of the freshwater tidal marsh, third in their conservation prioritization. Subwatershed 104 represents the northernmost portion of this conservation area, above the zone of tidal influence. Residential development exists on large parcels along the southern boundary of the subwatershed and along Jolly Pond Road in the northwestern corner. Future residential development off of eastern Jolly Pond Road will likely expand into the north-central portion of Subwatershed 104.

Recommendations include implementation of BSD principles for future development where it is permitted. With regard to preservation, the northern half of the subwatershed is the area with highest potential due to possible future pressure for development in the vicinity of Jolly Pond. Although Jolly Pond is located in Subwatershed 201, residential areas along Jolly Pond Road may have a tendency to expand, likely spreading south into Subwatershed 104. By incentivizing the placement of uplands adjacent to the existing RPA into permanent preservation, especially in the northern portions of the subwatershed, the effects of such expansion may be reduced, and protection of water quality, hydrology, and riparian habitat may be significantly increased. Refer to Conservation Area ID C6 in Table 1-3 and in Figure 1-7.

## 6.5 Subwatershed 105

**Table 6-9. Subwatershed 105 Summary**

General Characteristics	Area (ac) / Length (ft)	Percent of Subwatershed Area
Drainage Area	630.00	100.0
Length of Mapped Streams	12118	--
Existing RPA	130.27	20.7
NWI Mapped Wetlands	35.45	5.6
Marshlands	0	0.0
Forested Land	444.89	70.6
Developable Area	395.06	62.7
Agricultural and Forestal District	440.54	70.0
Zoning		
General Agriculture	521.76	82.8
General Business	1.83	0.3
General Residential	0	0.0
Limited Business	0	0.0
Low-Density Residential	0	0.0
Public Lands	14.12	2.2
Residential Planned Community	6.70	1.1
Land Use and Stream Condition	Current	Future
Impervious Cover	3.21	12.1
Subwatershed Classification	sensitive	impacted

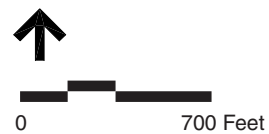
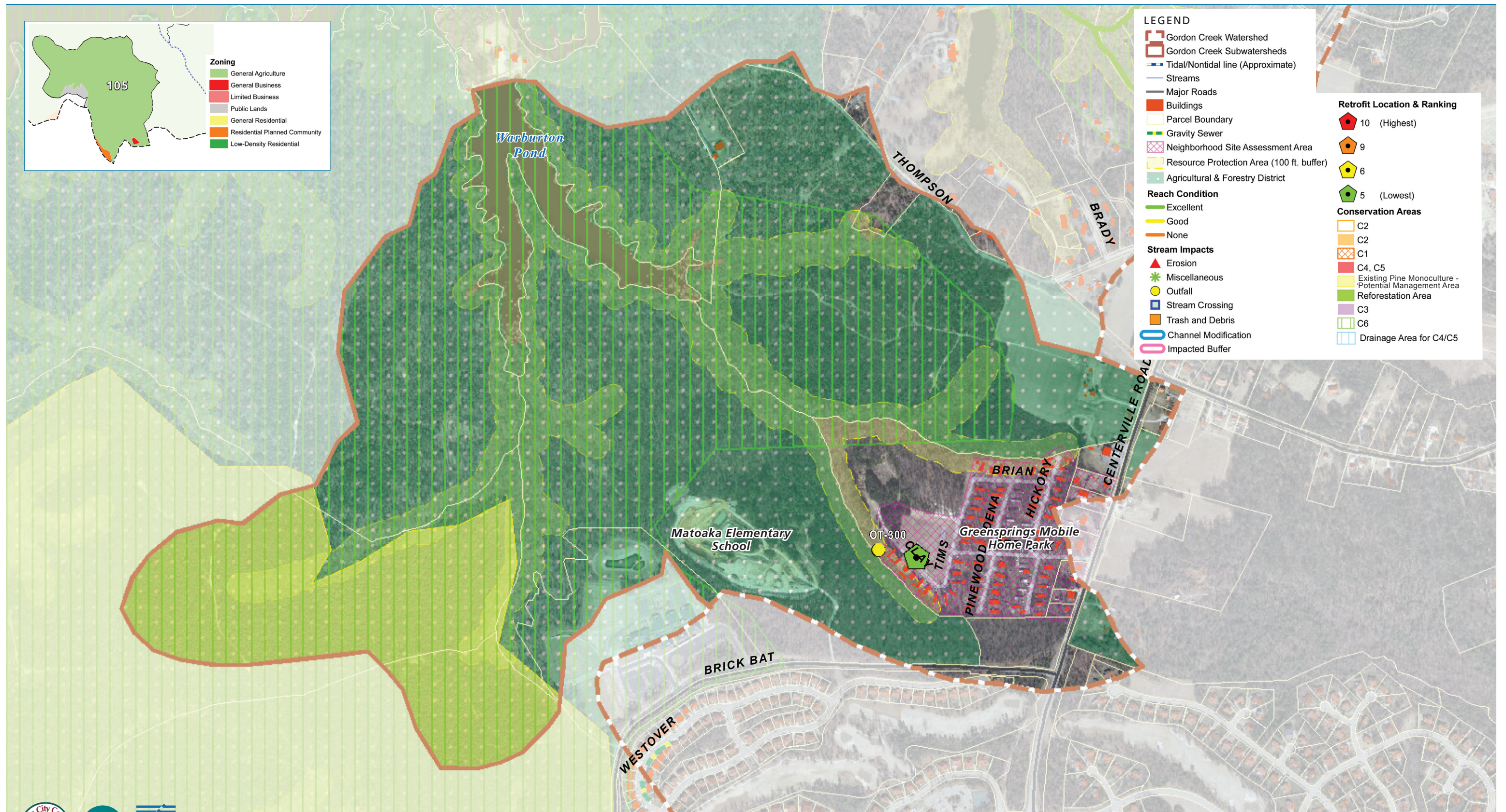




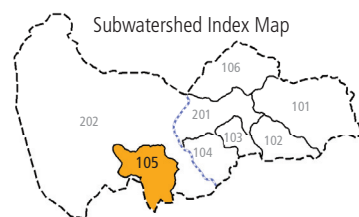


This Page Intentionally Left Blank





data provided by CWP, January, 2008



## GORDON CREEK

### Watershed Management Plan

Figure 6-5

**Watershed Conditions**  
**Subwatershed 105**



### Existing Land Use

Subwatershed 105 extends from the Warburton Pond Dam east to the intersection of Centerville Road and News Road and then south to the intersection of Centerville Road and Brick Bat Road (Figure 6-5). Although it is located below the limit of tidal influence in the greater Gordon Creek watershed, the presence of Warburton Pond Dam excludes tidal influence into Subwatershed 105.

The drainage area for Subwatershed 105 is approximately 540 acres in size and is composed of approximately 82 percent forested cover and approximately 3.2 percent impervious surfaces. The majority of the area is zoned as A1; however, a dense residential development occurs in the southeastern corner of the subwatershed as the Greensprings Mobile Home Park off of Centerville Road.

### Development and Activity in Subwatershed 105

Dense residential development occurs in the southeastern corner of the subwatershed as the Greensprings Mobile Home Park off of Centerville Road. A privately owned sand and gravel operation exists just to the south. The newly constructed Matoaka Elementary School is also located in this subwatershed and contains an oversized detention basin.

### General Stream Conditions

The central stream branch within the drainage originates just south of the Greensprings Mobile Home Park and receives stormwater from the development via subsurface infrastructure outfalls. According to the *Baseline Assessment*, streams within subwatershed 105 were not assessed due to lack of permission for access.

The following table summarizes specific stream impacts within Subwatershed 105 identified by the CWP during field reconnaissance. Refer to Figure 6-5 for the locations of these impacts.

**Table 6-10. Summary of Stream Impacts / Miscellaneous Features in Subwatershed 105**

Site ID	Subwatershed	Description
OT-300	104	Single 36-inch circular concrete outfall. Chipped/cracked with moderate flow. Trash present.

### Stormwater Strategy

#### Special Stormwater Criteria

New development and previously unreviewed development plans should implement on-site stormwater practices in accordance with the SSC to preserve high quality habitat.

#### Additional Comments

- Due to the lack of access, limited by land owner permission, additional assessment of existing stormwater management in the Greensprings Mobile Home Park is recommended as well as an evaluation of all outfalls and conditions directly downstream of outfalls. Opportunities for retrofits may be possible after further investigation.





- Special attention should be given during plan review to detention practices in this subwatershed in relation to Warburton Pond Dam to ensure it is not compromised by stormwater input from future developments.
- Utilize BSD principles in new construction to maintain existing hydrology, preserve contiguous open space, and minimize impacts from impervious surfaces.

### **Conservation Opportunities**

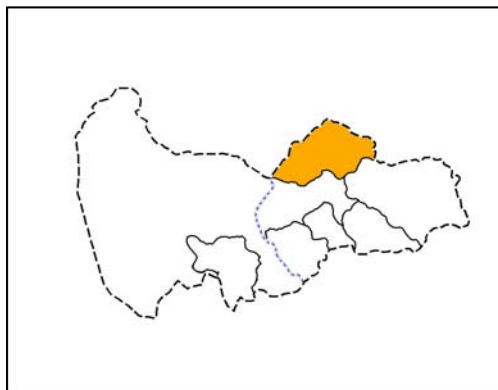
The majority of Subwatershed 105 is included in Conservation Area C6, described as the downstream half of the Gordon Creek watershed within the main area of tidal marsh. Warburton Pond is also located within this area. The eastern portion of this subwatershed contains high density residential development and agricultural fields. Refer to Conservation Area ID C6 in Table 1-3 and in Figure 1-7.

An area dominated by loblolly pine exists in the southwestern quarter of Subwatershed 105. This area was highlighted in the *Baseline Assessment* as being worthy of consideration for selective thinning to increase the diversity of the tree assemblage.

## 6.6 Subwatershed 106

**Table 6-11. Subwatershed 106 Summary**

General Characteristics	Area (ac) / Length (ft)	Percent of Subwatershed Area
Drainage Area	689.02	100.0
Length of Mapped Streams	13355	--
Existing RPA	187.01	27.1
NWI Mapped Wetlands	46.73	6.8
Marshlands	15.39	2.2
Forested Land	587.22	85.2
Developable Area	229.23	33.2
Agricultural and Forestal District	180.02	26.1
Zoning		
General Agriculture	241.71	35.1
General Business	0	0.0
General Residential	0	0.0
Limited Business	0	0.0
Low-Density Residential	71.26	10.3
Public Lands	376.05	54.6
Residential Planned Community	0	0.0
Land Use and Stream Condition	Current	Future
Impervious Cover	2.94	6.2
Subwatershed Classification	sensitive	sensitive

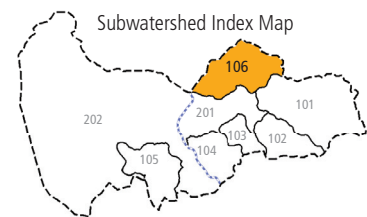
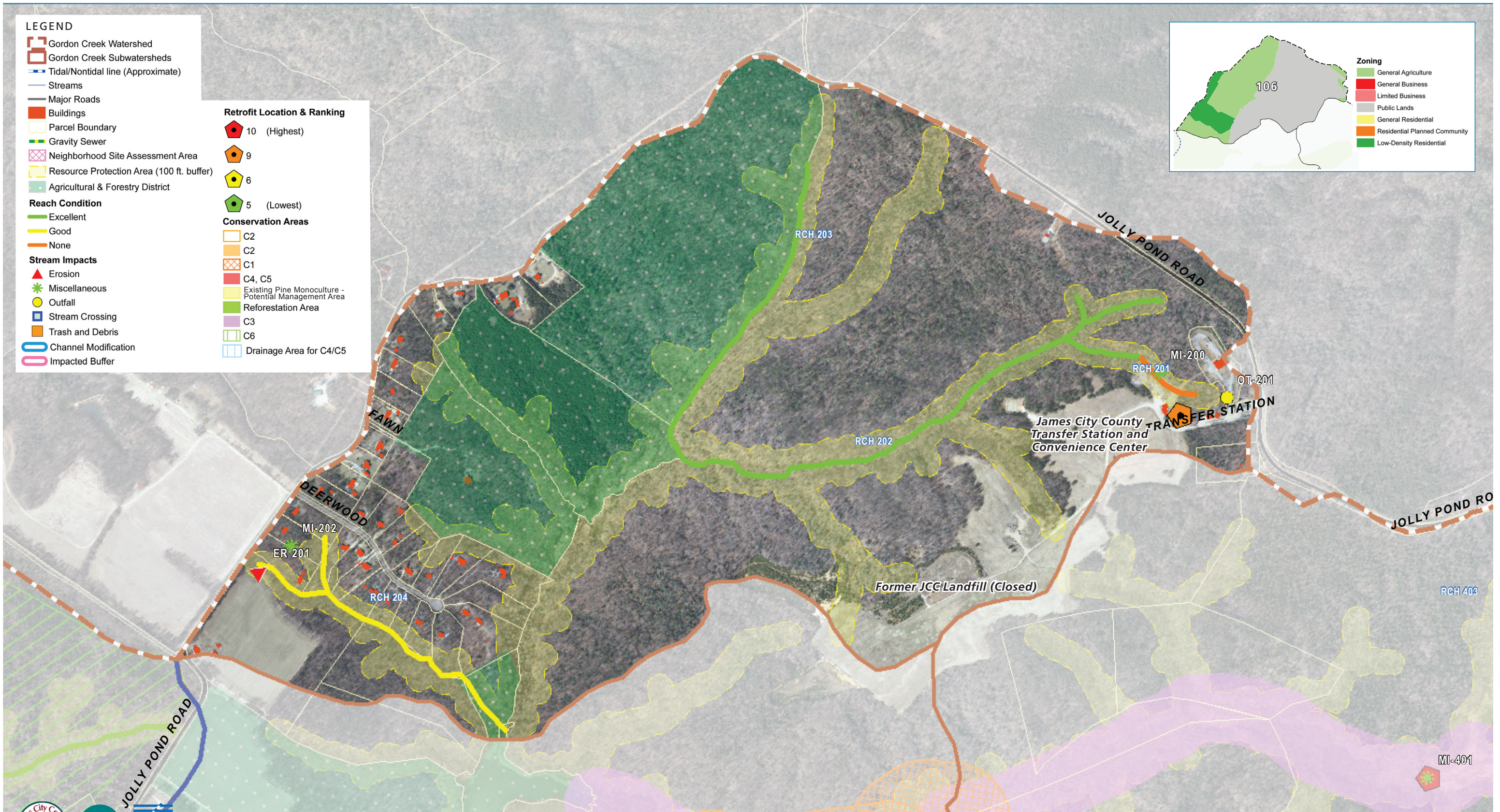






This Page Intentionally Left Blank





data provided by CWP, January, 2008

# GORDON CREEK

## Watershed Management Plan

Figure 6-6

**Watershed Conditions**  
**Subwatershed 106**



## Existing Land Use

Subwatershed 106 is the westernmost drainage area above the zone of tidal influence in the Gordon Creek watershed (Figure 6-6). Total drainage area is roughly 690 acres with approximately 85 percent forested cover and approximately 2.9 percent impervious surfaces. While 35 percent of Subwatershed 106 is zoned as A1, much of the area remains undeveloped, with public lands accounting for approximately 55 percent of the total area. Only about 10 percent of the subwatershed is zoned for low density residential uses, and the JCC Solid Waste Transfer Station and Convenience Center exists along the northeastern boundary of the subwatershed.

## Development and Activity in Subwatershed 106

The JCC Solid Waste Transfer Station and Convenience Center and Sanitary Landfill exist along the northeastern boundary of the subwatershed and parallel to Stream Reach 202 (RCH 202) for the majority of its length. A stormwater outfall from the transfer facility discharges directly to the stream. As described in Section 1.2 of this report, a retrofit for RCH 201 is recommended as a moderate priority action. The proposed retrofit will involve improvements to the water level control structure of the extended detention facility at this location and will include minor channel stabilization and riparian buffer reestablishment (see Section 1.2 for a more detailed description of the proposed action).

A groundwater compliance monitoring program is in place at the Sanitary Landfill. Monitoring wells have been located to intercept constituents should they migrate toward surface water. The County has not reported surface water impact to the DEQ. If constituents are detected in wells during natural attenuation monitoring that suggest a threat to surface water, samples will be collected and a surface water mitigation plan will be developed, if necessary.

## General Stream Conditions

Stream Reach 204, located in the southern portion of the drainage area, and was given a rating of 'good,' reflecting minor degradation. This is likely caused by surrounding land use. Farm fields are located adjacent to the south and a zoned low-density residential district (R-6) is located adjacently to the north. In-channel erosion and a headcut extending into the farm field were observed by the CWP during field reconnaissance.

The following table summarizes specific stream impacts within Subwatershed 106 identified in the *Baseline Assessment*. Refer to Figure 6-6 for the locations of these impacts.

**Table 6-12. Summary of Stream Impacts / Miscellaneous Features in Subwatershed 106**

Site ID	Subwatershed	Description
ER-201	106	Headcut advancing into farm field
MI-200	106	24-inch deep advancing headcut
MI-202	106	Location of Specimen tulip poplar - 40-inch DBH
OT-201	106	Single 15-inch concrete outfall



## Stormwater Strategy

### Special Stormwater Criteria

New development and previously unreviewed development plans should implement on-site stormwater practices in accordance with the SSC to preserve high quality habitat.

### Additional Comments

- Potential stream restoration opportunity to implement natural channel design to arrest the head cut, stabilize, and protect farmland from encroachment. Potential retrofit opportunity at Solid Waste Transfer Station, see Section 1.2.
- Assess condition of all outfalls and stream crossings. Unless there is a stability problem, no action is required.
- Utilize BSD principles in new construction to maintain existing hydrology, preserve contiguous open space, and minimize impacts from impervious surfaces.

## Conservation Opportunities

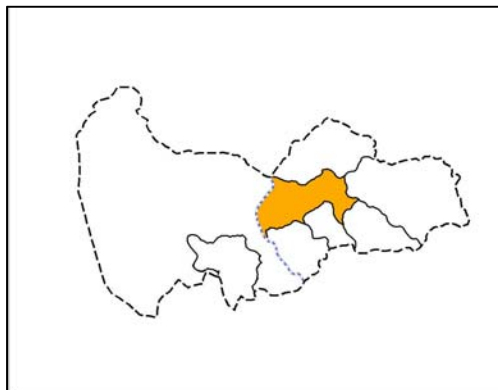
Despite land disturbances associated with the Solid Waste Transfer Station, a closed landfill, and a residential development, the majority of the subwatershed is forested. Contiguous forests within this subwatershed are part of an extensive unfragmented block extending to the northeast and beyond the Gordon Creek watershed. The resulting high quality interior habitat as well as the extensive stream systems throughout the area provide valuable corridors for wildlife. Recommendations include incentivizing the preservation of uplands adjacent to existing RPA boundaries and wetlands to help limit future development and forest fragmentation.



## 6.7 Subwatershed 201

**Table 6-13. Subwatershed 201 Summary**

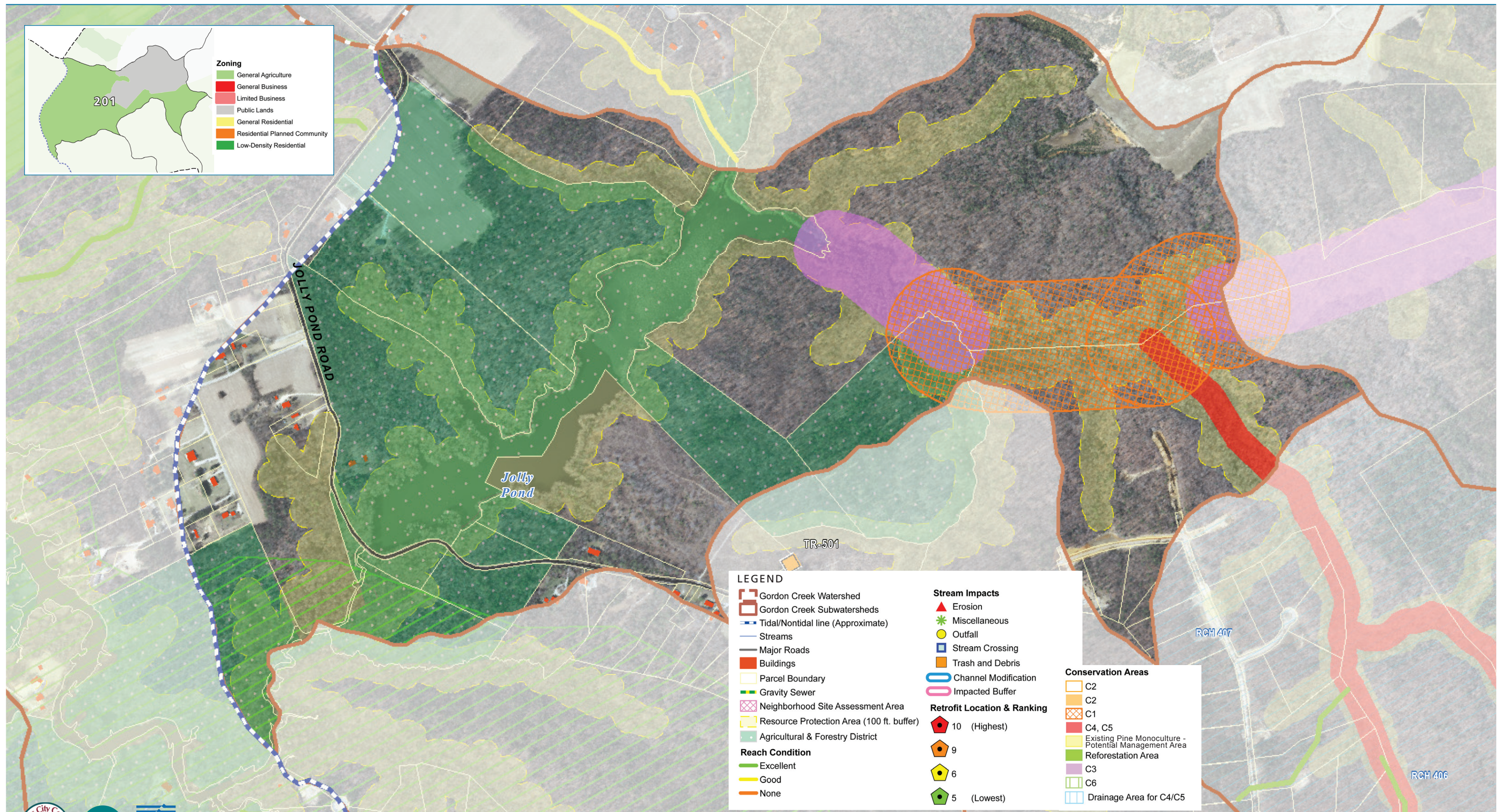
General Characteristics	Area (ac) / Length (ft)	Percent of Subwatershed Area
Drainage Area	614.75	100.0
Length of Mapped Streams	10804	--
Existing RPA	233.77	38.0
NWI Mapped Wetlands	99.39	16.2
Marshlands	31.48	5.1
Forested Land	529.3	86.1
Developable Area	258.71	42.1
Agricultural and Forestal District	236.02	38.4
Zoning		
General Agriculture	433.73	70.6
General Business	0	0.0
General Residential	0	0.0
Limited Business	0	0.0
Low-Density Residential	0	0.0
Public Lands	181.02	29.4
Residential Planned Community	0	0.0
Land Use and Stream Condition	Current	Future
Impervious Cover	0.12	5.3
Subwatershed Classification	sensitive	sensitive





This Page Intentionally Left Blank





# GORDON CREEK Watershed Management Plan

Figure 6-7

**Watershed Conditions  
Subwatershed 201 (Non-tidal Mainstem)**



### Existing Land Use

Subwatershed 201 is located at the center of the Gordon Creek watershed and includes the non-tidal mainstem, incorporating a total of approximately 615 acres (Figure 6-7). Of this, 77 percent represents forested uplands, 9.1 percent represents forested wetlands, and only 0.1 percent is impervious. This area is zoned approximately 71 percent as A1; however much of it cannot be developed due to the extensive presence of forested wetlands and associated RPAs. Jolly Pond is located at the center of Subwatershed 201. The remaining approximately 29 percent of Subwatershed 201 is under ownership by JCC as Public Lands.

### Development and Activity in Subwatershed 201

Agricultural properties occur along the southern boundary of the subwatershed, which corresponds with the upper limit of tidal influence. Drainage from the associated farm fields may have an impact on the waters of Jolly Pond; however, the CWP was unable to complete an assessment for this subwatershed due to limited access by the presence of forested wetlands.

### General Stream Conditions

CWP was unable to complete a stream assessment for Subwatershed 201 due to limited access by the presence of extensive forested wetlands.

### Stormwater Strategy

#### Special Stormwater Criteria

New development and previously unreviewed development plans should implement on-site stormwater practices in accordance with the SSC to preserve high quality habitat.

#### Additional Comments

- A detailed stream assessment is recommended in order to provide a more sensitive analysis of conditions within the subwatershed. Particularly, a greater emphasis should be given to water quality in Jolly Pond as well as a stability assessment of tributaries and headwaters.
- One of the Strategic Actions for this watershed management plan is working with the land owner and state and federal regulatory and consulting agencies to develop a long-term monitoring plan for Jolly Pond Dam (see Section 3.3).
- Chemical water quality analysis may also be advisable to monitor the effects of agricultural land use on the aquatic environment.
- Utilize BSD principles in new construction to maintain existing hydrology, preserve contiguous open space, and minimize impacts from impervious surfaces.





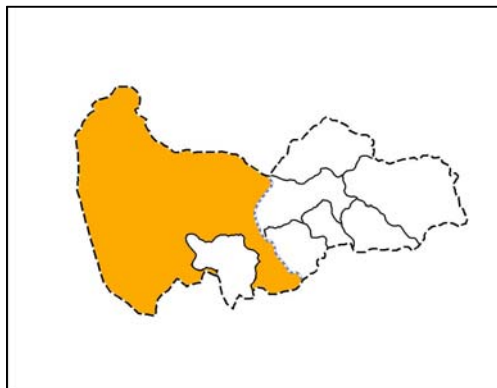
## Conservation Opportunities

Jolly Pond lies at the heart of Subwatershed 201, surrounded by mature contiguous forest and swampy areas of bald cypress trees. Jolly Pond offers diverse habitat conditions for many species of waterfowl and amphibians. Upstream of Jolly Pond, beaver damming at Freedom Park has resulted in impounded waters and high value wetlands that are part of Colby Swamp. Evidence of bald eagle nesting has been identified in this area as well. Incentivizing the preservation of forested upland areas adjacent to RPA boundaries and potential nesting sites is recommended. Future development within Subwatershed 201 should utilize low-impact development practices to minimize fragmentation of contiguous forest. Refer to Conservation Area IDs C1 and C3 in Table 1-3 and in Figure 1-7.

## 6.8 Subwatershed 202

**Table 6-14. Subwatershed 202 Summary**

General Characteristics	Area (ac) / Length (ft)	Percent of Subwatershed Area
Drainage Area	4685.61	100.0
Length of Mapped Streams*	282356	--
Existing RPA	2533.27	54.1
NWI Mapped Wetlands	1809.28	38.6
Marshlands	908.1	19.4
Forested Land	4048.25	86.4
Developable Area	2120.81	45.3
Agricultural and Forestal District	1834.46	39.2
Zoning		
General Agriculture	4580.05	97.7
General Business	0	0.0
General Residential	0	0.0
Limited Business	0	0.0
Low-Density Residential	0	0.0
Public Lands	97.72	2.1
Residential Planned Community	7.85	0.2
Land Use and Stream Condition	Current	Future
Impervious Cover	0.91	5.7
Subwatershed Classification	sensitive	sensitive

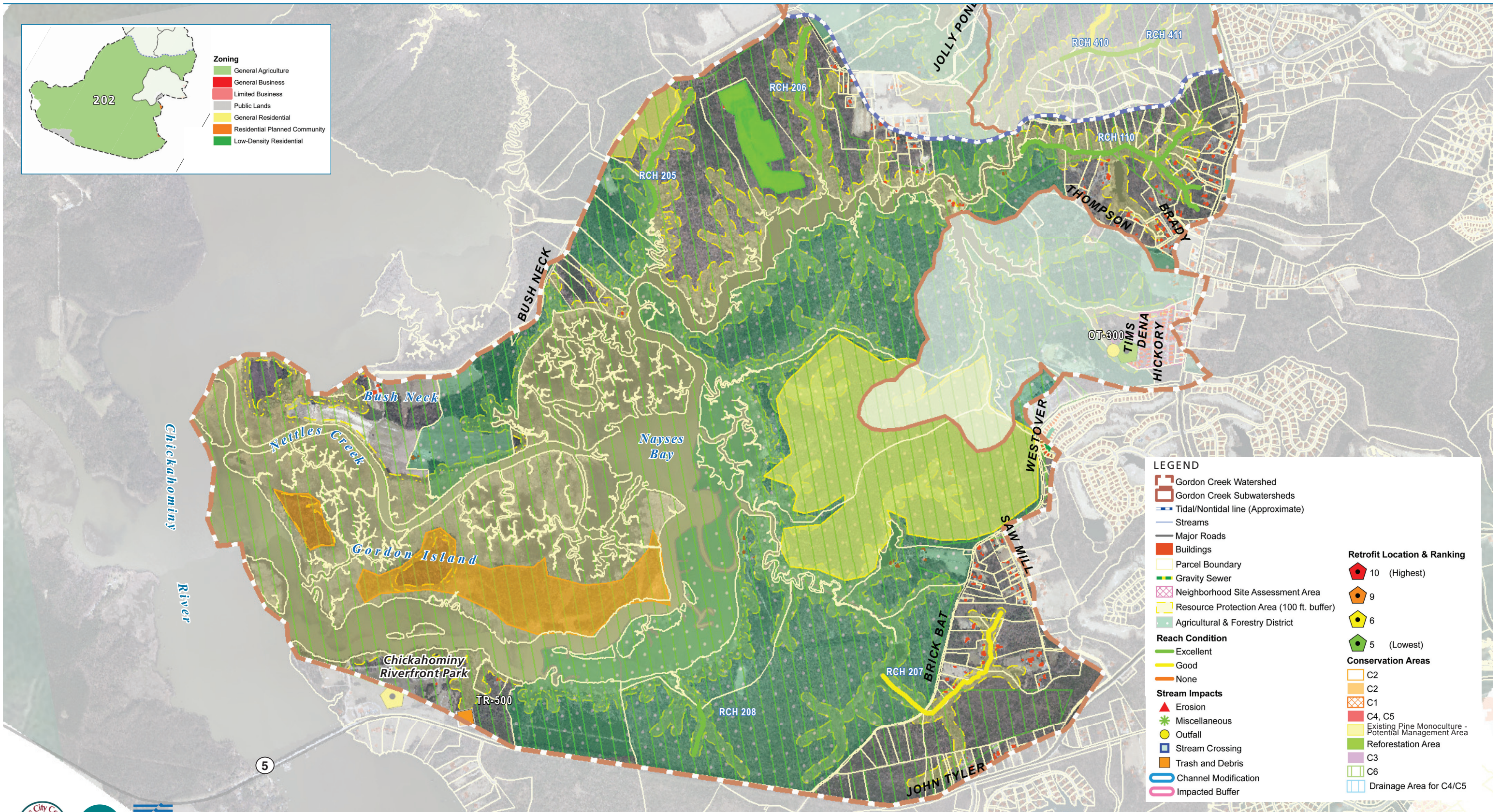






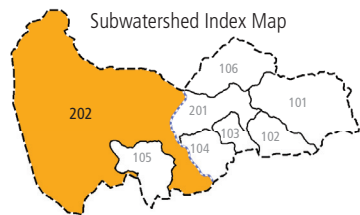
This Page Intentionally Left Blank





0 2,000 Feet

data provided by CWP, January, 2008



## GORDON CREEK

### Watershed Management Plan

Figure 6-8

**Watershed Conditions**  
**Subwatershed 202 (Tidal Mainstem)**



## Subwatershed Description

Subwatershed 202 includes the tidal mainstem of Gordon Creek, extending to its confluence with the Chickahominy River (Figure 6-8). It is the southernmost and largest subwatershed in the Gordon Creek watershed, comprising a total area of nearly 4,746 acres. Zoned almost entirely as A1, Subwatershed 202 is largely forested (55 percent of land cover) with an extensive forested wetland and freshwater tidal marsh system in its lower region. The expansiveness of these wetlands serves as a limiting factor for development, amounting to approximately 31 percent of overall land cover.

## Development and Activity in Subwatershed 202

Agricultural uses occur around the periphery with the largest cleared areas adjacent to the Chickahominy River. Very little of the subwatershed is developed and impervious surfaces total only about 0.9 percent of land cover. The majority of this residential development is located just east of Brick Bat Road in the southeastern corner of the drainage area.

## General Stream Conditions

The *Baseline Assessment* evaluated four of the streams within this drainage area, all of which were first and second order. Access to the rest of the watershed was limited due to the extent of wetlands. Of the assessed streams, Reaches 206 and 208 were rated as 'excellent' and Reaches 205 and 207 were rated as 'good.' The source of the minimal degradation in Reach 205 is likely associated with drainage from upstream agricultural uses. Alternately, Reach 207 likely showed some effects from the residential development and stream crossing at Brick Bat Road.

## Stormwater Strategy

### Special Stormwater Criteria

New development and previously unreviewed development plans should implement on-site stormwater practices in accordance with the SSC to protect high quality habitat.

### Additional Comments

- A detailed stream assessment is recommended in order to provide a more sensitive analysis of conditions within the subwatershed. Particularly, a greater emphasis should be given to the evaluation of the mainstem channel and specific erosion problem areas should be identified in tributary streams.
- Chemical water quality analysis may also be advisable to monitor the effects of agricultural land use on the aquatic environment.
- Utilize Better Site Design (BSD) principals in new construction to maintain existing hydrology, preserve contiguous open space, and minimize impacts from impervious surfaces.





## Conservation Opportunities

The CWP's *Baseline Assessment and Conservation Area Plan* ranks the lower half of the Gordon Creek watershed, including the main area of the freshwater tidal marsh, third in their conservation prioritization. Subwatershed 202 represents the majority of this area, below the zone of tidal influence. Most of this land is held by private landowners, including several hunt clubs and the Powhatan Association; however, development is largely restricted due to the expansive marshlands surrounding Nayses Bay and the Gordon Creek mainstem and its tributaries, as well as the associated RPA. Existing conditions provide diverse habitat for a multitude of species of waterfowl and raptors, making these areas ideal candidates for permanent protection.

Several old-growth forested islands exist at the mouth of Gordon Creek. They remain undisturbed and contain numerous specimen trees, many with diameters exceeding 40 inches at breast height. Old growth forests provide potential habitat for sensitive plants, amphibians, and birds such as the bald eagle. Much of this area is likely protected by the existing RPA and falls within the (as yet undedicated) Gordon Creek Natural Area.

The principal recommendation within Conservation Area ID C6 is to promote mixed hardwood forest by the active management of existing pine monocultures. Also, incentives to replant cleared land to create larger, protected tracts of contiguous forest should be considered. Refer to Conservation Area ID C6 in Table 1-3 and in Figure 1-7.